

Application No. 09/848,777
Filed: May 4, 2001
Group Art Unit: 1641

REMARKS

Claims 1-21 and 30-32 were pending in the present application. Claim 17 is cancelled without prejudice. Claims 9, 14, 15, 16 and 18 are amended herein. Accordingly, claims 1-16, 18-21 and 30-32 will be pending upon entry of the present amendment.

Support for the amendments to the claims can be found throughout the specification and claims as originally filed. Amendments made herein are further explained below. No new matter has been added.

Any amendments to the claims should in no way be construed as acquiescence to any of the Examiner's rejections and was done solely to expedite the prosecution of the application. Applicant reserves the right to pursue the claims as originally filed in this or a separate application(s).

Claim Objections

The Examiner objected to claims 1-15 because they improperly depend, either directly or indirectly from a higher numbered claim. Applicants submit that this is common practice during the prosecution of an application. The allowed claims will be renumbered by the U.S. Patent and Trademark Office when the patent is printed.

Claim Rejections - 35 U.S.C. §112, 2nd Paragraph

Claims 9, 14-15, 18-21 and 31 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite.

Applicants respectfully traverse the foregoing rejection. However, claim 9 has been appropriately amended herein to depend from the correct claim. Claims 14, 15 and 18 have been amended to

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recite "a" concentration, thereby overcoming the lack of antecedent basis rejection.

Claims 19-21 and 31 are rejected for reciting a diameter less than a certain length. The Examiner argues that this range includes zero, but a diameter of 0 means that there is no matrix or particle present. Applicants respectfully disagree. It is reasonable that based on the fact that the claims recite a particle, such particle in existence would always have a certain diameter. Any ordinary person skilled in the art would consider that such a diameter of a particle would not include zero. Accordingly, Applicants respectfully request reconsideration and withdrawal of the foregoing rejection to claims 19-21 and 31.

Claim Rejections - 35 U.S.C. §102

Claims 1-6, 10, 14 and 16-18 are rejected under 35 U.S.C. §102(b) as being anticipated by Van Ness et al. (U.S. Patent 5,667,976). The Examiner states that the "reference discloses solid supports for nucleic hybridization assays, wherein nylon coated magnetic beads may be used (abstract and Col. 14). Oligonucleotides are immobilized via covalent attachment onto the beads and serve as probes (abstract and claim 1). The beads may be employed free in solution (abstract)...."

Applicants respectfully traverse the foregoing rejection.

The present invention is directed to a liquid composition comprising a colloidal suspension of a biomolecule-binding matrix material dispersed in a liquid, wherein particles of the matrix material in the colloidal suspension are of a defined particle size. In the claims as amended, the biomolecule binding matrix material is made of nitrocellulose, polyvinyl difluoride or activated nylon. In one aspect of the invention, the particles of

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the matrix material are distributed uniformly throughout the colloidal suspension. In accordance with the invention, a colloidal suspension of a biomolecule-binding matrix is in liquid form. See, for example, page 3, lines 20-27, and page 4, lines 15-23. The plain and ordinary meaning of a "colloid" includes "[a] suspension of finely divided particles in a continuous medium, esp. a gaseous, liquid, or solid substance, ... containing suspended particles that are approx. 5 to 5,000 angstroms in size, do not settle out of the substance rapidly, and are not readily filtered." Webster's II New College Dictionary, Houghton Mifflin Company, Boston, 1999. As such, the present invention comprises a biomolecule-binding matrix material that is dispersed in a continuous medium that prevents the particles of the matrix material from being settled rapidly. Moreover, the claims recited that the particles of the matrix material are also of a known defined particle size.

Van Ness et al. fails to anticipate each and every element as set forth in the claims. The claimed invention specifically comprises a colloidal suspension whereas Van Ness et al. discloses particles, such as beads, on a solid support. The Examiner mentions that the beads of Van Ness et al. may be employed free in solution. However, "[t]he identical invention must be shown in as complete detail as is contained in the ... claim." Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The beads of Van Ness et al. are not identical in property to the particles of the matrix material in the claimed invention. Not only are the beads polymer coated latex beads, which is distinguishable from the present invention, the property of the beads of Van Ness et al. is such that they will settle out of solution in a microtiter well, for example. In contrast, the

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biomolecule binding matrix material of the claimed invention is in a colloidal suspension that will not easily settle out of solution. It remains uniformly in solution to be applied in a liquid format. Another advantage of the invention over the art is that, as the colloid-based matrix material is in liquid format and in a colloidal suspension, the cross-linking and blocking steps can be performed at the manufacturer's level, reducing greatly the variability and processing time that occur when these steps are carried out at the laboratory level. Van Ness et al. not only fails to show each and every element but also fails to describe how to make the claimed invention such that an ordinary skilled artisan can practice the invention. The claimed invention provides certain characteristics that are not practicable with the teachings of Van Ness et al. Van Ness et al. fails to describe or teach such a colloidal suspension of a biomolecule-binding matrix material.

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Claims 1, 3-4, 6-9 and 16 are also rejected under 35 U.S.C. §102(b) as being anticipated by Nagai et al. (U.S. Patent 5,194,372). Applicants respectfully disagree. Similarly, Nagai et al. also fails to anticipate the particular features and advantages of the present invention. Nagai et al. describes a method of detecting disorders in genomic substances by using a polymer-coated support, such as a bead, to covalently attach oligonucleotides. While Nagai et al. indicates that the beads can be free in solution, these beads are distinguishable from the present invention since they will settle out of solution, such as in a microtiter well. As described above, in contrast, the matrix material particles of the present invention are in a colloidal suspension in liquid, which will not settle out of solution. Moreover, Nagai et al. defines the "bead" as "any type of solid or

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hollow sphere, ball, bearing, cylinder, or other similar configuration composed of plastic, ceramic, metal, or polymeric material onto which a nucleic acid can be covalently immobilized." (See column 3, lines 48-52.) Not only is the material of the bead different from that of the present invention, but by inference, these beads are particles with substance that will precipitate out of any solution. Therefore, the presently claimed invention is distinguishable from Nagai et al.

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Claims 1, 3-4, 6-10, 13-16 and 18-21 are rejected under 35 U.S.C. §102(e) as being anticipated by Delair et al. (U.S. Patent 6,033,853). Applicants respectfully traverse the foregoing rejection. The Examiner states that Delair et al. describes "a kit for detecting a nucleic acid sequence comprising a labeled nucleotide probe and a reagent consisting essentially of a suspension of insoluble particles on which at least one series of oligonucleotides are immobilized. The kit may be used in hybridization assays (abstract)." The present invention is distinguishable in that the colloidal suspension of the invention is a biomolecule-binding matrix material dispersed in a liquid, where the matrix material is of a defined particle size and where the matrix material is made of nitrocellulose, polyvinyl diflouride, or activated nylon. The matrix material in the colloidal suspension of the invention will not settle out of solution. Delair et al. fails to anticipate each and every element of the claimed invention. *in what way*

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Claims 1, 3-6, 10, 13, 16 and 19-21 are rejected under 35 U.S.C. §102(b) as being anticipated by Kawaguchi et al. (U.S. Patent 5,122,600). Applicants respectfully disagree. Kawaguchi et al. is directed to DNA-immobilized microspheres that have synthetic DNA chains having base sequences to which the protein as

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a transcription-controlling factor binds specifically. Similar to the other cited references, Kawaguchi et al. fails to anticipate a biomolecule-binding matrix material suspended in colloidal form. The microspheres of Kawaguchi et al. are plainly distinguishable from the present invention in that they are not soluble and will precipitate in liquid.

Claims 1, 3, 10, 12, 16 and 19-21 are rejected under 35 U.S.C. §102(b) as being anticipated by Lewis et al. (WO 00/00808). Applicants respectfully disagree. Lewis et al. fails to anticipate the claimed invention. Lewis et al. deals with a sensing array for chemical analytes using conductive or non-conductive metal materials. The claimed invention is directed to a colloidal suspension of biomolecule-binding matrix material. The Examiner states that the nanoparticles for incorporation into the array in Lewis et al. are dispersible in a wide variety of organic solvents (Lewis et al., page 12, lines 15-16 of the specification). However, this is different from a biomolecule-*binding matrix material in colloidal form* of the present invention. Additionally, the nanoparticles in Lewis et al. comprises a core made of a metal. In contrast, the present invention comprises a biomolecule-binding matrix material made of nitrocellulose, polyvinyl difluoride for activated nylon. Accordingly, Lewis et al. fails to anticipate the claimed invention.

Claims 1, 3-9, 14-16 and 18-21 are rejected under 35 U.S.C. §102(b) as being anticipated by Seul (WO 97/40385). Applicants respectfully disagree. The Examiner argues that Seul discloses the manipulation of colloidal particles where molecules may be attached. However, the colloidal particles of Seul are a polymer lattice made of latex beads, which are distinguishable from the

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present invention. As described above, the present invention is directed to a biomolecule-binding matrix material made of nitrocellulose, polyvinyl difluoride, or nylon. Seul cannot anticipate the claimed invention.

None of the cited references anticipate the claimed invention. Each and every element of the claimed invention is not set forth in a single prior art reference. Accordingly, Applicants respectfully request reconsideration and withdrawal of the foregoing rejections.

Claim Rejections - 35 U.S.C. §103

Various dependent claims are rejected under 35 U.S.C. §103 as being obvious over the references cited above, either alone or in combination. Claims 30-32 are rejected over Seul, Lewis et al., Kawaguchi et al. or Delair et al. Claim 30 is rejected over Nagai et al. or Van Ness et al. Claims 10-13 are rejected over Seul or Nagai et al. Claims 11 and 13 are rejected over Lewis et al. Claims 11 and 12 are rejected over Kawaguchi et al. Claims 11 and 12 are rejected over Delair et al. Finally, claims 11-13 are rejected over Van Ness et al.

Applicants respectfully traverse the foregoing rejections.

As explained above, the primary references mentioned above fail to anticipate each and every element of the claimed invention. The primary references also fail to teach or suggest the claimed invention. None of the cited references teaches or suggests providing a biomolecule binding matrix material, which is made of nitrocellulose, polyvinyl difluoride, or nylon, in colloidal suspension. The cited references refer specifically to, for example, insoluble or synthetic particles, which are distinguishable from the particles of the present invention.

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Knowledge of one of ordinary skill in the art would not cure any of the deficiencies found in the primary references since the primary references lack the teaching or suggestion to come up with the present invention. Furthermore, "identification in the prior art of each individual part claimed is insufficient to defeat patentability of the whole claimed invention... Rather, to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant." *In re Kotzab*, 55 U.S.P.Q.2d 1313, 1316 (Fed. Cir. 2000). Since none of the references teaches or suggests a colloidal suspension of a biomolecule-binding matrix material, an ordinary skilled artisan would not find the requisite motivation in the cited art to make the specific combination as recited in the claims.

Moreover, none of the cited references provides the requisite motivation to combine them in the manner suggested in the Office Action, nor does the Office Action proffer any such motivation. This is especially true when one considers the number of deficiencies that each reference contains when compared to the instant claims.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the foregoing rejection of the claims.

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CONCLUSION

In view of the foregoing amendments and remarks, Applicant believes that the present application is in condition for allowance.

The Examiner is encouraged to telephone the undersigned attorney to discuss any matter that would expedite allowance of the present application.

Respectfully submitted,

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